AQA Qualifications

GCSE

Applications of Mathematics (Linked Pair Pilot)

93702F

Unit 2: Foundation Tier

Mark scheme

93702F
June 2014

Final v1.0

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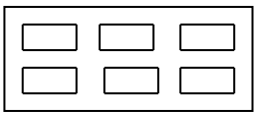
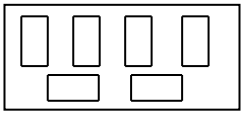
Glossary for Mark Schemes

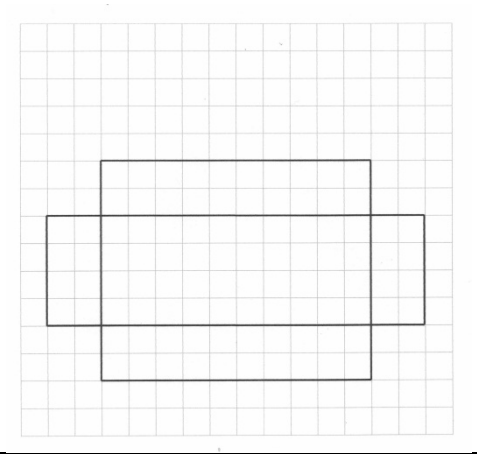
GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

M	Method marks are awarded for a correct method which could lead to a correct answer.
M dep	A method mark dependent on a previous method mark being awarded.
A	Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
B	Marks awarded independent of method.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
ft	Follow through marks. Marks awarded following a mistake in an earlier step.
SC	Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
oe	Or equivalent. Accept answers that are equivalent. eg, accept 0.5 as well as $\frac{1}{2}$
[*a*, *b*]	Accept values between *a* and *b* inclusive.

A2 Foundation Tier

Q	Answer	Mark	Comments
1(a)	680	B1	
1(b)	1.6(00)	B1	oe eg $1\frac{3}{5}$
2	1.89 + 1.65 or 3.54	M1	oe eg 189 + 165 or 354
	5 – their 3.54 or 1.46	M1	oe eg 500 – their 354 or 146
	£1 20p 20p 5p 1p	A1ft	If M1M0 or M0M1 scored ft from their 146 condone 4 to 6 coins
3(a)	Completely correct diagram	B2	B1 Any one correct section Allow vertices ± 2mm

Q	Answer	Mark	Comments
3(b)	**Alternative method 1**		
	Clear diagram showing 6 (or 7) rectangles. Eg Two rows of 3 (× 8 cm) across  or One row of 4 (× 6 cm) across and one row of 2 (or 3) (× 8 cm) across 	B2	B1 Diagram with at least one row of 3 (× 8 cm) across or Diagram with at least one row of 3 (× 6 cm) across or Diagram with at least one column of 2 (× 6 cm) down or Diagram with at least one column of 1 (× 6 cm) and 1 (× 8 cm) down
	Alternative method 2		
	Complete explanation. Eg $3 \times 8 = 24$ and $2 \times 6 = 12$ or $24 \div 3 = 8$ and $12 \div 2 = 6$ or 3 across is less than 25 and 2 down is less than 15	B2	B1 Partial explanation. Eg $3 \times 8 = 24$ or $2 \times 6 = 12$ or $24 \div 3 = 8$ or $12 \div 2 = 6$ or 3 across is less than 25 or 2 down is less than 15
	Alternative method 3		
	$(25 \times 15) \div (8 \times 6) = 7.(...)$	B1	oe

Q	Answer	Mark	Comments
4(a)	Any four single room costs seen	M1	**Must** be 70 or 110 but not necessarily a combination of 70 and 110 eg 70 (+) 110 (+) 110 (+) 110 2 × 70 and 2 × 110 70 (+) 70 (+) 70 (+) 70 210 and 110
	Any four single room costs added	M1	**Must** use a combination of 70 and 110 eg 70 + 110 + 110 + 110 or 400 or 70 + 70 + 70 + 110 or 320
	360	A1	SC2 520
4(b)	Thursday room 140 and Friday room 120	B1	Can be implied from daily totals Bill does not have to be complete
	Friday breakfast 23	B1	
	Total bill 283	B1ft	ft their 140 + their 120 + their 23 or their 140 + their 143 For B1B1B1ft must complete bill correctly
5	Fully correct 	B3	B2 adding a 10 by 4 rectangle and two 4 by 2 rectangles in correct positions or adding a 10 by 4 rectangle and 4 by 2 rectangle and 10 by 2 rectangle in correct positions B1 adding a 10 by 4 rectangle in correct position SC2 Fully correct follow through net for 10 by x by 2 cuboid with $x \neq 4$

Q	Answer	Mark	Comments
6(a)	2	B1	
6(b)	[5.8 cm, 6.2 cm] or [58 mm, 62 mm]	B2	oe eg [2.25 inches, 2.45 inches] B1 [5.8, 6.2] or [58, 62] Units may be incorrect or missing or [2.8 cm, or 3.2 cm] or [28 mm, 32 mm]
6(c)	Circle, centre P, radius [3.8, 4.2] cm and Two radii drawn from *P* each at [43˚, 47˚] to given line stopping at inner circle (± 2mm)	B2	B1 Circle, centre *P*, radius [3.8, 4.2]cm or Two radii drawn from *P* each at [43°, 47°] to given line

Q	Answer	Mark	Comments
7(a)	16	B2	B1 Diagram showing 6 or 7 tables in a row with evidence of counting edges or people on the diagram or Calculation leading to 16 eg 7 + 7 + 2 or (4) (6) (8) 10 12 14 (16)
7(b)	Arrangement with exactly 12 tables in rows that will seat exactly 30 that has exactly one row of four tables and no single table. Eg One row of 6 and one row of 4 and one row of 2 One row of 5 and one row of 4 and one row of 3	B3	B2 Arrangement with exactly 12 tables in rows that will seat [28, 32] that has exactly one row of four tables and no single table. Eg One row of 4 and two rows of 3 and one row of 2 (32 people) or Arrangement with exactly 12 tables in rows that will seat exactly 30 people that does **not** have exactly one row of four tables or no single tables. Eg Two rows of 5 and one row of 2 Three rows of 4 or Arrangement with exactly 12 tables some not in rows that will seat exactly 30 people that has exactly one row of four tables and no single table One 2 by 2 square, one row of 4 and two rows of 2 B1 Arrangement with [11, 13] tables that will seat [26, 34] people that may or may **not** have exactly one row of four tables or no single table. Eg One row of 4 and two rows of 3 and two single tables Four rows of 3 One row of 4 and three rows of 3 One row of 4 and three rows of 2 and one single tables

Q	Answer	Mark	Comments
8(a)	(6, 4)	B1	
8(b)	700	B2	B1 7 seen or 600 or 800 or Shortest route shown on diagram
8(c)	(3, 6)	B2	Allow (6, -1) or (7, 0) or (8, 1) for B2 B1 (0, 5) or (1, 4) or (1, 6) or (2, 3) or (2, 5) or (3, 2) or (4, 1) or (4, 5) or (5, 0) or (5, 4) or (6, 3) or (2, 6)
9(a)	75°	B1	Any unambiguous indication
9(b)	075	Q1ft	Strand (i) Must have 0 as first digit ft their (a) Allow [073, 077]
10(a)	60	B1	
10(b)	55	B1	
10(c)	No and Valid explanation. Eg (Because) the angle should be 45 Other angle is 48 so there are no equal angles (which means it is not isosceles) (Because) 42 + 42 + 90 = 174 (not 180)	B1	oe

Q	Answer	Mark	Comments
11(a)	16	B1	
11(b)	5×20(cm) = 100(cm) and 100cm = 1m **or** 20(cm) = 0.2(m) and 5×0.2(m) = 1(m)	Q2	oe Strand (ii) Fully correct explanation Q1 5×20(cm) = 100(cm) or 100 cm = 1m or 20(cm) = 0.2(m) or 5×0.2(m) = 1(m)
11(c)	$5 \times$ their 16 or 80 **or** $3 \times$ their 16 or 48 **or** 5×3 or 15 **or** Rectangle split in to 15 squares	M1	their 16 from (a)
	$5 \times$ their 16 $\times 3$	M1	Implies the first M1
	240	A1ft	only ft their 16
12(a)	5 (miles)	B1	
12(b)	4.20	B1	
12(c)	1.20	B1ft	ft their (b) – 3
13(a)	4.5	B1	
13(b)	$30 \times 20 \times 20$ or 12 000	M1	
	12000 ÷ 1000 or 12	M1	$2 \times$ their 4.5 $\times$ 1000 or their 9000
	12 and their 9 and Yes or 12 ÷ their 4.5 = their 2.6(...) and Yes or 12000 and their 9000 and Yes	A1ft	ft correct decision based on their (a) if M2 scored

Q	Answer	Mark	Comments
14(a)	120 + 90 + 120 + 90	M1	oe
	420	A1	
14(b)	120 × 90 or 10 800	M1	
	their 10 800 × 4.15	M1	
	44 820	A1	
	45 000	B1ft	ft if cost > 500 seen and correctly rounded to nearest 1000
15(a)	[80 (mph), 82 (mph)] and France or Point on line at 130 km/h identified and France or [111 (km/h), 113 (km/h)] and France or Point on line at 70 mph identified and France	B1	Condone 110 (km/h)

Q	Answer	Mark	Comments
15(b)	**Alternative method 1**		
	(60mph) → 96 (km/h)	B1	288 (km) → 180 (miles)
	288 (km) ÷ their 96 (km/h) or 3(h)	M1	their 180 (miles) ÷ 60 (mph) or 3 (h)
	10.45 (am) + their 3(h) or 1.45 (pm) or 2 (pm) – their 3(h) or 11(.00 am) or 2 (pm) – 10.45 (am) or 3.25(h) or 3h 15min	M1	Condone 3.15(h)
	Yes and their 1.45 (pm) or Yes and their 11(.00 am) or Yes and their 3(h) and their 3.25(h) or Yes and their 15 minutes	A1ft	ft B0 M2 Only ft their 96 (km/h) or their 180 miles
	Alternative method 2		
	(60mph) → 96 (km/h)	B1	
	2 (pm) – 10.45 (am) or 3.25(h) or 3h 15min	M1	Condone 3.15(h)
	288 (km) ÷ their 3.25(h) or [88, 89] (km/h)	M1	
	Yes and their [88, 89] (km/h) and their 96 (km/h)	A1ft	ft B0 M2 Only ft their 96 (km/h) or 180 (miles)

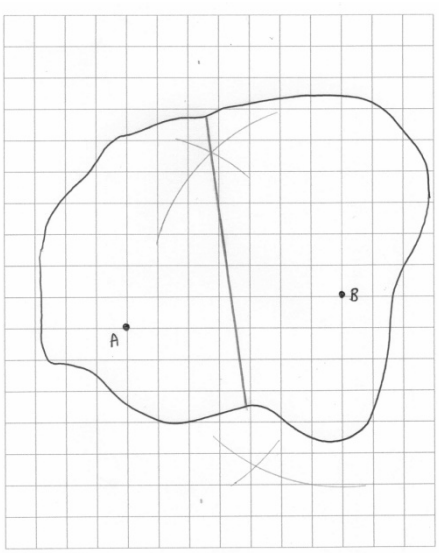
Q	Answer	Mark	Comments
15(b)	**Alternative method 3**		
	2 (pm) – 10.45 (am) or 3.25(h) or 3h 15min	M1	Condone 3.15(h)
	288 (km) ÷ their 3.25(h) or [88, 89] (km/h)	M1	
	[88, 89] (km/h) → [54, 56] (mph)	B1ft	ft their [88, 89] (km/h)
	Yes and [54, 56] (mph)	A1	
	Alternative method 4		
	2 (pm) – 10.45 or 3.25(h) or 3h 15min	M1	Condone 3.15(h)
	60 (mph) × their 3.25(h) or 195 (miles)	M1	
	195 (miles) → 312 (km)	B1ft	ft their 195 (miles)
	Yes and 312 (km)	A1	

Q	Answer	Mark	Comments
15(b)	**Alternative method 5**		
	(60mph) → 96 (km/h)	B1	
	2 (pm) – 10.45 (am) or 3.25(h) or 3h 15min	M1	Condone 3.15(h)
	their 96 (km/h) × their 3.25(h) or 312 (km)	M1	
	Yes and their 312 (km)	A1ft	ft B0 M2 Only ft their 96 (km/h)
	Alternative method 6		
	288 (km) → 180 (miles)	B1	
	2 (pm) – 10.45 (am) or 3.25 (h) or 3 (h) 15 (min)	M1	Condone 3.15 (h)
	their 180 (miles) ÷ their 3.25 or [55, 56] (mph) or 60 (mph) × 3.25 (hours) or 195 (miles)	M1	
	Yes and their [55, 56] (mph) or Yes and their 180 (miles) and 195 (miles)	A1ft	ft B0M2 Only ft their 180 (miles)

Q	Answer	Mark	Comments
16(a)	Any correct equation e.g.1 $2x + x + 96 + 96 = 360$ e.g.2 $2x + x + 96 + 96 = 360$ e.g.3 $x + \frac{1}{2}x + 96 = 180$	B1	
	Correct rearrangement of their equation to the form $ax = b$ or $\frac{360 - 96 - 96}{3}$	M1	$3x = 168$ or $\frac{3}{2}x = 84$ oe if B1 Follow through their equation of form $px + q = r$ a, b, p, q and r all non-zero
	56	A1ft	ft their $ax = b$ if M1 gained

	Answer	Mark	Comments
16(b)	Fully correct explanation e.g.1 Labels large rectangle a and b or labels diagonals of kite a and b Area rectangle = $a \times b$ Area kite = $\frac{1}{2}$ × product of diagonals = $\frac{1}{2} \times a \times b$ e.g.2 Labels each part of top edge with w and the side parts with x and y Area rectangle = $2w(x + y)$ = $2wx + 2wy$ Area kite = $\frac{1}{2}wx + \frac{1}{2}wx + \frac{1}{2}wy$ $+ \frac{1}{2}wy$ = $wx + wy$ e.g.3 Draws both diagonals of kite and indicates there are 4 pairs of equal areas e.g.4 Draws at least one diagonal of the kite and states that the area of a triangle is half the area of a rectangle e.g.5 Uses compatible numbers and correctly works out areas of kite and rectangle For example Labels each part of top edge with 4 and the side parts with 3 and 6 Rectangle area = 8 × 9 = 72 Kite area = 0.5 × 8 × 3 + 0.5 × 8 × 6 = 12 + 24 = 36	B2	B1 Partially correct statement or correct step towards correct explanation e.g.1 Labels large rectangle a and b or labels diagonals of kite a and b Area rectangle = $a \times b$ Area kite = $\frac{1}{2} \times a \times b$ e.g.2 Labels each part of top edge with w and the side parts with x and y Area rectangle = $2w(x + y)$ Area kite = $\frac{1}{2}wx + \frac{1}{2}wx + \frac{1}{2}wy + \frac{1}{2}wy$ e.g.3 Draws both diagonals of kite e.g.4 Uses compatible numbers and works out areas of kite and rectangle with correct method but makes arithmetic error(s) For example Labels each part of top edge with 4 and the side parts with 3 and 6 Rectangle area = 8 × 9 = 82 Kite area = 0.5 × 8 × 3 + 0.5 × 8 × 6 = 12 + 24 = 36

	Answer	Mark	Comments
17	**Alternative method 1**		
	150 ÷ 6 or 25 (1 person)	M1	150 × 2 or 300 (12 people) or $\frac{150}{2}$ or 75 (3 people)
	their 25 × 15	M1dep	their 300 + their 75 or their 75 × 5
	375	A1	
	Alternative method 2		
	15 ÷ 6 or 2.5	M1	
	their 2.5 × 150	M1dep	
	375	A1	

	Answer	Mark	Comments
18	Two pairs of intersecting arcs with equal radii from centres *A* and *B*	M1	
	Straight line between the intersecting arcs (may go outside the island and/or not be all the way across the island)	A1	
	Line goes all the way across the island but no further	Q1ft	Must have gained M1 ft their line Strand (ii) Accurate interpretation of context SC1 Line in tolerance but no arcs
19(a)	70 – 22 – 22 or 26 seen	M1	26 may be seen on the diagram
	572	A1	
19(b)	Smooth curve passing though (0, 0), (5, 300), (10, 500), (15, 600), (17.5, 612.5), (20, 600), (25, 500), (30, 300) and (35, 0)	B2	B1 Any six points plotted correctly from (0, 0), (5, 300), (10, 500), (15, 600), (17.5, 612.5), (20, 600), (25, 500), (30, 300) and (35, 0) All points within half a square Points can be implied by a graph
19(c)	area ÷ 0.75	M1	0 < area ≤ 650
	[816, 817]	A1	
	816	B1ft	ft value or calculation rounded down to nearest integer SC1 612.5 seen